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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/827,106	04/05/2001	Pei-Haw Tsao	67,200-344	5011

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EXAMINER

VU, HUNG K

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 08/09/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/827,106

Applicant(s)

TSAO ET AL.

Examiner

Hung K. Vu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 May 2002.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claims 1 and 11 are objected to because of the following informalities:

In claim 1, line 4, "the substrate" should be changed to "a substrate".

In claim 1, line 6, "a plurality" should be changed to "said plurality".

In claim 1, line 7, "a substrate" should be changed to "the substrate".

In claim 1, line 11, "an electrode" should be change to "said electrode".

In claim 11, line 1, after "array", insert --(BGA)--.

In claim 11, lines 9-10, "a BGA package" should be changed to "said BGA package substrate".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al. (PN 6,319,750, of record).

Huang et al. discloses, as shown in Figures 2A-3, a matrix form semiconductor package substrate having an electrode situated in-between a plurality of integrated circuit (IC) package substrates for providing electrical communication to conductive pads situated on a substrate comprising,

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the plurality of IC package substrates (210a,210b,310a,310b) integrally formed on the substrate strip in a matrix form having a boundary between each two of the plurality of IC package substrates, each of the plurality of IC package substrates having a multiplicity of conductive pads;

the electrode (220,320) formed in a serpentine configuration along the boundary for providing electrical communication to the multiplicity of conductive pads and for providing insulation between the multiplicity of conductive pads after the plurality of IC packages are cut along the boundary through the electrode.

Huang et al. teaches to form the electrode in a zigzag shaped to help the package to be substantially free of trace short-circuits due to misaligned cutting during singulation process.

Huang et al. does not disclose forming the electrode in a rectangular-shaped. However, the purpose of the present claimed invention is the same as that of Huang et al., that is to prevent the short-circuits between the electrode. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the electrode of Huang et al. having the shaped as claimed, since it has been held that change in form and/or shape of any element of prior patent must result in more than useful natural phenomenon that man has accumulated through common knowledge; even though use of new device greatly improves field and provides great utility, and commercial success is enjoyed because of long-felt need, these features cannot sustain patentability where involved is only extended application of obvious attributes from prior art.

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With regard to claims 2, 14, and 15, Huang et al. discloses the electrode being a plating bar formed of an electrically conductive material. Note that the term “in an electroplating process” is method recitation in a device claimed, and it is non-limiting, because only the final product is relevant, not the method of making. A product by process claim is directed to the product per se, no matter how actually made. See also MPEP 2113. Moreover, an old or obvious product produced by a new method is not a patentable product, whether claimed in “product by process” claims or not.

With regard to claim 3, Huang et al. discloses all of the claimed limitations except the material of the plating bus. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the plating bus of Huang et al.'s having the materials as that claimed by Applicant, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

With regard to claim 4, Huang et al. discloses the plurality of IC package substrates being at least four IC package substrates arranged in a matrix form.

With regard to claim 5, Huang et al. discloses the matrix form semiconductor substrate being for a ball grid array package.

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With regard to claim 6, Huang et al. discloses the plurality of IC package substrates integrally formed in such a way that traces on adjacent package substrates at corresponding opposite positions are connected together by the electrode.

With regard to claim 7, Huang et al. discloses the multiplicity of conductive pads being connected electrically to a multiplicity of wirebond fingers by a multiplicity of traces.

With regard to claim 8, Huang et al. discloses the electrode being formed in a corrugated configuration.

With regard to claims 9, 12, and 13, Huang et al. discloses the electrode being formed in a corrugated configuration with each one of two legs of a corrugation connected to an oppositely positioned IC package substrates.

With regard to claim 10, Huang et al. discloses the electrode provides electrical communication to the multiplicity of conductive pads by electrically connecting to a plating bath.

With regard to claim 16, Huang et al. discloses the device further comprising a plurality of solder balls (not shown) formed on a bottom surface of the BGA package substrate.

With regard to claims 17-18, although Huang et al. does not teach the exact the amplitude of the serpentine configuration, as that claimed by Applicants, however, the amplitude differences are

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considered obvious design choices and optimization that one skill in the art would be considered as obvious.

3. Claims 1 - 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiu et al. (PN 6,121,678, of record).

Chiu et al. discloses, as shown in Figure 4 and 7, a matrix form semiconductor package substrate having an electrode situated in-between a plurality of integrated circuit (IC) package substrates for providing electrical communication to conductive pads situated on a substrate comprising,

the plurality of IC package substrates (42) integrally formed on the substrate strip in a matrix form having a boundary between each two of the plurality of IC package substrates, each of the plurality of IC package substrates having a multiplicity of conductive pads (58);

the electrode (48) formed in a serpentine configuration along the boundary for providing electrical communication to the multiplicity of conductive pads and for providing insulation between the multiplicity of conductive pads after the plurality of IC packages are cut along the boundary through the electrode.

Chiu et al. teaches to form the electrode in a cylindrical form. Huang et al. does not disclose forming the electrode in a rectangular-shaped. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the electrode of Chiu et al. having the shaped as claimed, since it has been held that change in form and/or shape of any element of prior patent must result in more than useful natural phenomenon that man has accumulated through common knowledge; even though use of new device greatly improves field and provides great utility, and commercial success is enjoyed because of long-felt need, these

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features cannot sustain patentability where involved is only extended application of obvious attributes from prior art.

With regard to claims 2 and 15, Chiu et al. discloses the electrode being a plating bar formed of an electrically conductive material. Note that the term “in an electroplating process” is method recitation in a device claimed, and it is non-limiting, because only the final product is relevant, not the method of making. A product by process claim is directed to the product per se, no matter how actually made. See also MPEP 2113. Moreover, an old or obvious product produced by a new method is not a patentable product, whether claimed in “product by process” claims or not.

With regard to claims 3 and 14, Chiu et al. discloses all of the claimed limitations except the material of the electrode or the plating bus. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the electrode or the plating bus of Chiu et al.’s having the materials as that claimed by Applicant, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

With regard to claim 4, Chiu et al. discloses the plurality of IC package substrates being at least four IC package substrates arranged in a matrix form.

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With regard to claim 5, Chiu et al. discloses the matrix form semiconductor substrate being for a ball grid array package.

With regard to claim 6, Chiu et al. discloses the plurality of IC package substrates integrally formed in such a way that traces on adjacent package substrates at corresponding opposite positions are connected together by the electrode.

With regard to claim 7, Chiu et al. discloses the multiplicity of conductive pads being connected electrically to a multiplicity of wirebond fingers by a multiplicity of traces (50).

With regard to claim 8, Chiu et al. discloses the electrode being formed in a corrugated configuration.

With regard to claims 9, 12, and 13, Chiu et al. discloses the electrode being formed in a corrugated configuration with each one of two legs of a corrugation connected to an oppositely positioned IC package substrate.

With regard to claim 10, Chiu et al. discloses the electrode provides electrical communication to the multiplicity of conductive pads by electrically connecting to a plating bath.

With regard to claim 16, Chiu et al. discloses the device further comprising a plurality of solder balls (not shown) formed on a bottom surface of the BGA package substrate.

With regard to claims 17 and 18, Chiu et al. discloses the serpentine configuration having an amplitude between about 0.3 mm and about 5 mm.

Response to Arguments

4. Applicant's arguments filed 05/13/02 have been fully considered but they are not persuasive.

It is argued, at pages 5-9 of the Remarks, that both Huang et al. and Chiu et al. do not disclose the shape of the electrode, as claimed. This argument is not convincing because Huang et al. teaches forming the electrode in a zigzag shaped to help the package to be substantially free of trace short-circuits due to misaligned cutting during singulation process. Huang et al. does not disclose the electrode formed in a rectangular-shaped. However, the purpose of the present claimed invention is the same as that of Huang et al., that is to prevent the short-circuits between the electrodes. Chiu et al. teaches forming the electrode in a cylindrical shaped to help the process of separating the packages from each other easier by cutting through the electrode. Therefore, one skill in the art would be motivated to form the electrode having the shaped as claimed, since it has been held that change in form and/or shape of any element of prior patent must result in more than useful natural phenomenon that man has accumulated through common knowledge; even though use of new device greatly improves field and provides great utility, and commercial success is enjoyed because of long-felt need, these features cannot sustain patentability where involved is only extended application of obvious attributes from prior art.

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Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

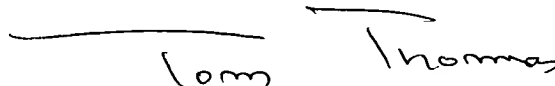
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung K. Vu whose telephone number is (703) 308-4079. The examiner can normally be reached on Mon-Thurs 7:00-5:30, Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Vu

August 6, 2002


TOM THOMAS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800